

Nuclear and Particle Physics Directorate Strategic Planning Retreat

Accelerators

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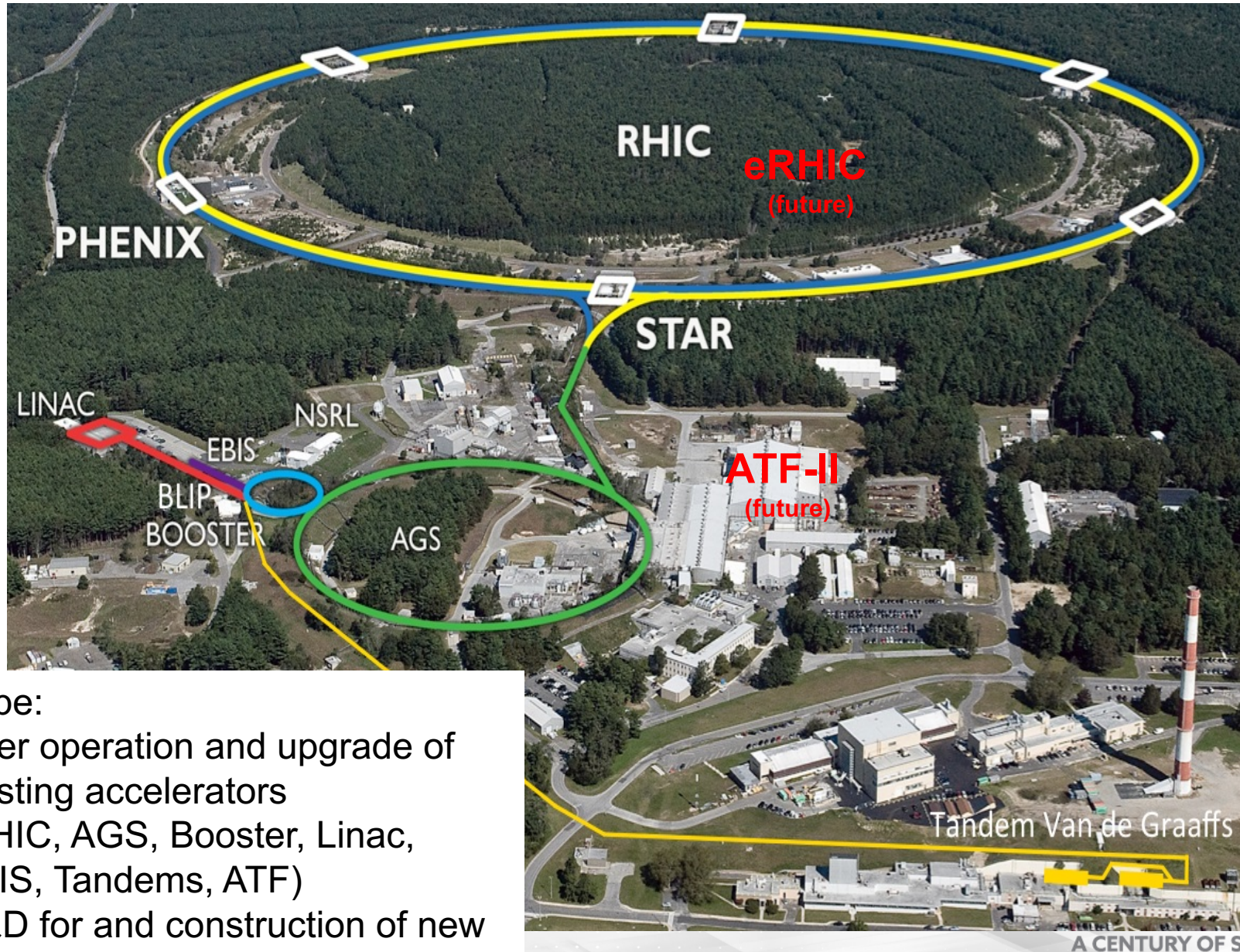
June 9, 2017

70 YEARS OF
DISCOVERY

A CENTURY OF SERVICE



Accelerators – Overview



ATF
(present,
not shown)

- Scope:
- User operation and upgrade of existing accelerators (RHIC, AGS, Booster, Linac, EBIS, Tandems, ATF)
 - R&D for and construction of new accelerators (ATF-II, eRHIC)

Accelerators – Internal strengths

- Only operating collider in Americas, only lab with polarized hadron beams
 - Unparalleled flexibility in energy and species
 - Proven track record of transforming R&D into physics program capabilities
 - Proven track record of delivering projected performance (luminosity, polarization)
- High brightness hadron beams due to cooling (stochastic, LEReC, CeC)
- Best in class or unique ion sources (high-intensity H⁻, OPPIS, LION/EBIS)
- Developing electron beam capabilities at C-AD (CeC, LEReC)
 - Storage ring electron beam experience nearby at NSLS-II
- ATF – unique combination of laser and electron beams
- Industrial users at BLIP (opportunistic use of Linac) and Tandem
- Unique flexibility at NSRL (opportunistic use of EBIS/Booster)
- Highly trained scientific and technical staff in above areas
= experienced staff for EIC design/construction/operation
- Connection to CASE Stony Brook for students

Accelerators – Internal weaknesses

- Aging infrastructure
 - AGS ops started 1960, Linac 1970, ...
- Still insufficient experience and capabilities in some growth areas
 - SRF, laser, e-guns, high current electron beams
- Project baselines (scope/cost/schedule) not always realistic
- Tendency to take on an unrealistic workload; resource planning and matrixing challenges
- Some internal process can be cumbersome and slow, e.g.:
 - hiring, promotion, termination, procurement, reviews and permits by other lab organizations
 - procedures often driven by strict compliance while organization is driven by outcome

Accelerators – External opportunities

- eRHIC (by far the largest prize)
 - Leverage NSLS-II expertise for EIC
 - Contribution to JLEIC if EIC sited at JLab
- Expand NSRL user base
- Expand isotope production capabilities
- Expand Tandem usage
- Expanded capabilities for users at ATF-II
 - Higher performance for existing capabilities at ATF-II
e.g. much higher power mid-IR laser system
- Participation in upgrades at other labs
 - e.g. SNS Proton Power Upgrade, FCC

Accelerators – External threats

- Reduced or uneven or uncertain federal funding
 - affects employee motivation and retention
 - retention of highly trained postdocs
- Lack of integrated planning across DOE offices utilizing BNL accelerator S&T capabilities
 - e.g. HEP support for SMD
- No EIC
- Loss of ATF-II funding
- EIC sited at JLab
 - might result in significant staff loss to JLab
- BLIP
 - Sr^{82+} production shifts to industry before new replacement isotopes are developed (e.g. Ac-225)
- Tandem
 - Main industrial Tandem user(s) terminate use
- Public perception of radiation risks

Accelerators – Short and long-term goals

Short-term goals:

- Run RHIC user program => continue ops/upgrades
 - successfully complete LEReC and CeC PoP
- Develop infrastructure for SRF, e-guns, lasers
- Complete a viable eRHIC conceptual design
- Construct and operate CBETA
- BLIP, NSRL, Tandem => continue ops/upgrades

Long-term goals:

- Construct ATF-II => need sufficient resources
- Construct eRHIC => need sufficient resources for R&D

Accelerators – Key concerns / issues

- Effective execution of multiple projects and R&D thrusts simultaneously
- Maintaining an effective and motivated staff during potential funding reductions
- Continuing to demonstrate excellence in performance and execution of user programs
- Maintain hadron complex infrastructure for additional 25+ years



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NPP Strategic Planning Retreat Template

Viewgraph Title Page: Your Combined Groups with Contributors

Viewgraph #1: Overview/Scope of Work for the Activities

Viewgraph # 2: What are the internal strengths related to these activities (i.e expertise, reputation, equipment, facilities, etc.)

Viewgraph # 3: What are the internal weaknesses related to these activities (i.e. lack of expertise, aging facilities, etc.)

Viewgraph # 4: What are external opportunities associated with these activities (i.e. anticipated growth in area, possible collaborations, etc.)

Viewgraph #5: What are the external threats associated with these activities (i.e. lack of funding, lack of new sponsors, competition, etc.)

Viewgraph #6: Goals – both short-term and long-term and how you plan to reach them

Viewgraph # 7: Key Concerns/Issues